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ABSTRACT

To examine the comprehension process employed by gifted readers and to identify the various metacognitive strategies they employ, 100 gifted student volunteers in grades 4 through 7 were administered the Iowa Tests of Basic Skills (ITBS), Reading Subtests 11 and 13. The students also completed a questionnaire to determine metacognitive awareness of strategy selection and use. Based on grade equivalence results of the ITBS subtest, level 13, the top five students in each grade level were selected to participate in protocol analysis of the comprehension process and an interview. Students were given two short passages with related questions from ITBS level 14 and asked to stop at indicated points to describe the text and what they were thinking. Findings revealed that all participants scored above grade level placement, and that students perceived their use of (1) failure to understand a clause, (2) rereading, (3) information about the story to understand context, (4) use of context to obtain meaning of words, (5) identification of main ideas and significant details, and (6) use of imagery, a previously unidentified strategy. The results suggest a need for teacher awareness of the comprehension process and metacognitive strategies. These could be incorporated into both critical and creative reading instruction, along with the general techniques of guided reading and structured overviews. (CRH)

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The Gifted Reader:
Metacognition and Comprehension Strategies

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The Gifted Reader:

Metacognition and Comprehension Strategies

The gifted reader generally scores two or more grade levels above chronological age peers on standardized reading comprehension tests. The reading comprehension process for most gifted readers is intuitively developed and applied in supplement to the reading instruction received in the classroom. What specific reading process is implemented by the gifted reader which provides the advanced level of reading comprehension? How much does the "giftedness" contribute to the reading comprehension process? These questions prompted an inquiry into both reading comprehension as process and the gifted reader as exemplary practitioner.

Purpose of the Study

The purpose of the study was to examine the reading comprehension process employed by gifted readers. The reading comprehension process was viewed as a problem-solving process which required the establishment of a goal and consequent deployment of patterns of behavior related to reaching that goal (Newell & Simon, 1972). These patterns of behavior may be recurrent both within the individual and across a group of individuals employing the reading comprehension process.

This study focused upon specific components of reading comprehension as a problem-solving process. The first focus was the identification of specific comprehension strategies (recurrent behavior patterns) used in comprehending a reading passage. The second focus was the examination of metacogniton in terms of the reading comprehension process. Metacognition involves the control and use of reading strategies in the sense of awareness of available strategies, of the need to select among the strategies, of the application of the strategies, and of the evaluatiom of the success of strategy use. A third focus was upon grade level differences in strategy use and metacognition.

Rationale

In the reading research literature, reading comprehension has been defined as an interactive process drawing upon sources within the readers as well as within the printed message (Levy, 1981; Otto, 1982). In the course of examining this process, good readers, identified as such based on the results of standardized tests of reading comprehension, have been the subjects. The reading comprehension process of these readers has been analyzed using a protocol analysis technique and the examination of protocols as stated by the reader. This research has identified specific reading strategies which are recurrently used by good readers in the process of comprehending the text (Kavale & Schreiner, 1979;

Olshavsky, 1976-77).

This same analysis procedure has not, however, been specifically applied to the gifted reader. The gifted reader is a gifted child who is reading fluently and with comprehension in advance of grade placement (Deffenbaugh, 1976; Hilton, 1974; Witty, 1971). Many of these gifted students have developed their advanced reading skills prior to formal instruction (Durkin, 1966; Terman, 1925; Witty, 1971). This independently developed reading process can be analyzed using those same research procedures as employed in the study of good readers.

Several assumptions about gifted readers directed this study:

1. Gifted readers have comprehension strategies available.
2. Gifted readers selectively apply these comprehension strategies as they read.
3. Gifted readers are metacognitively aware of strategies and their deployment..

The examination of the reading comprehension process employed by gifted readers identified those strategies used and the control exercised over the reading comprehension process.

Subjects

The subjects were 100 students in grades 4 (n=25), 5 (n=31), 6 (n=29), and 7 (n=15). These students had been identified as gifted via the school's gifted/talented program criteria. One criterion was that the student read two or more grade levels above grade placement as measured by a standardized test of reading comprehension. The students represented various socioeconomic groups from lower to upper income families, from single parent to two parent families. The equal division by sex, female = 50 and male = 50, was purely accidental. Participants were volunteers and included only those who returned signed consent forms. From the larger group of 100, 20 students were selected for participation in the protocol analysis and ethnographic interview components. The selection of the 20 was based on the Iowa Tests of Basic Skills (ITBS), Reading Comprehension subtest scores: the 5 highest scores (reported as grade equivalents) on level 13 from each grade were selected as participants. Again the equal division by sex (female = 10, male = 10) was strictly accidental.

Research Procedures

Traditional research procedures. The group of 100 gifted students participated in two research procedures. The ITBS Reading Comprehension subtest, levels 11 and 13, was used as a means of measuring reading comprehension ability and to establish that these gifted students were reading in

advance of grade placement. The individual results were reported as grade equivalents in line with the ITBS designations.

A questionnaire was administered to the same group of 100 gifted students. The questionnaire was designed to ask students about strategy usage. Metacognitive awareness in the form of selection, use, and evaluation of strategies was the focus of the questionnaire. Students were asked to evaluate frequency of use of specific behaviors under conditions set out in the question. The responses were then analyzed by grade level.

Ethnographic research procedures. Twenty students were selected from the larger group of 100 based on grade equivalence results on the ITBS Reading Comprehension subtest, level 13. The top five grade equivalents from each grade were selected for participation in protocol analysis and the interview. The protocol analysis procedure was used to examine the reading comprehension process. As used in previous research (Kavale & Schreiner, 1979; Olshavsky, 1976-77), the protocal analysis procedure provided immediate description by the individual of the behaviors exercised in the process of reading. The use of protocol analysis allowed for minimal interruption to the reading process while still restricting the subject to a discussion of what is read in combination with what the subject was thinking and doing in order to comprehend the message.

In this procedure, the subject was given two short

passages with the related questions from the ITBS, Reading Comprehension subtest, level 14. The student was asked to read, stopping at indicated points to describe what was happening in the text and what she/he was thinking as the passage was read. The student was asked to follow the same procedure as multiple choice questions were read and answers selected. The whole procedure was tape recorded for later analysis.

The same 20 students who participated in protocol analysis also participated in the ethnographic interview. The interview questions were developed to reflect those reading strategies indicated as used frequently by responses to the metacognition questionnaire. Following the protocol analysis session, the student was interviewed concerning strategy use. The interview was taped for later analysis.

Data Analysis

The results of the ITBS, Reading Comprehension subtest, level 13, revealed that the subjects of this study were gifted readers. Each one scored above grade level and most scored three to four grade levels above grade placement. In Table 1 the student identification number is provided and then the student's grade equivalent score. The student with the highest grade equivalent is recorded first and then the student with the lowest grade equivalent for that grade is recorded. The grade equivalents ranged as shown in Table 1.

TABLE 1

Highest and Lowest Grade Equivalent on ITBS

Reading Comprehension Subtest, Level 13

Grade	Grade Equivalent
Grade 4 (n = 25)	
001	10.4
020	5.6
Grade 5 (n = 31)	
027	10.7
054	6.5
Grade 6 (n = 29)	
057	12.8
067	7.3
Grade 7 (n = 15)	
087	11.4
095	8.6

Though the range of grade equivalents vary widely within each grade, all were still above grade level placement. The level 13 subtest is appropriate for seventh grade students (ITBS Teachers Guide, 1979). The students involved in this study, fourth, fifth, and sixth grade, scored above their grade placement on a test designed for average seventh grade readers.

The metacognition questionnaire indicated that students perceived themselves as using the following reading strategies:

1. Stated failure to understand a clause
2. Rereading
3. Use of information about the story to understand the story
4. Use of context to obtain meaning for unknown word
5. Identify main idea and the significant details

The results of the questionnaire indicated an awareness of which strategies are most effective and which are most frequently employed to comprehend reading material.

The protocol analysis results supported the results of the metacognition questionnaire in that students verbalized awareness of strategies and their use during the protocol analysis session. Each taped verbalization of a protocol analysis session was transcribed and analyzed for recurrent patterns/behaviors. Patterns/behaviors as described by the students were classified into categories of strategies already established (Olshavsky, 1976-77). A new strategy

category, use of imagery, was established as behaviors involving imagery were described. The protocol analysis transcripts were then reanalyzed to confirm appropriate placement of behavior descriptions. Each time an individual described a behavior, it was placed in the specific strategy category and was counted as one use. The number of times each strategy was described by subjects in each grade level was totaled. The results are included in Table 2. For example, "use of imagery" was used 26 times by the 5 fourth grade subjects.

The results of the protocol analysis procedure indicated a use of strategies as a means of comprehending. Students were aware of use of strategies, those available for use, the active selection among strategies, and the effectiveness of the particular strategy. Protocol analysis procedures confirmed that gifted readers in this study used reading strategies and that they were metacognitively aware of strategies and their use in the reading comprehension process.

The ethnographic interview focused on specific reading strategies and asked students to describe selection, deployment, and use of the strategies. The interview was tape recorded and later transcribed. The transcribed responses to the interview questions were analyzed to determine how the students perceived the strategy, why they used strategies, and how they were used. The responses were also analyzed for statements which indicated metacognitive awareness. Students

TABLE 2

Protocol Analysis: Strategy Occurrence by Grade Level

	Grade Level Occurrences				
	4 (n = 5)	5 (n = 5)	6 (n = 5)	7 (n = 5)	Total (n = 20)
Personal identification	1	4	3	1	9
Use of context	9	4	7	8	28
Synonym substitution	12	10	3	5	30
Stated failure to understand a word	11	6	8	7	32
Rereading	17	11	28	20	76
Inference	2	5	3	6	16
Addition of information	15	5	14	2	36
Hypothesis	7	10	2	2	21
Stated failure to understand a clause	4	3	2	6	15
Use of information about the story	7	4	4	0	15
Identification of main idea and details	not verbalized				
Imagery	26	8	12	10	56

found it easy to discuss strategies such as rereading and the use of context. Perhaps the previous experience with the questionnaire and the protocol analysis sesssions made the strategies and their use more explicit and thus, easier to discuss. Their discussions confirmed the use of strategies, and indicated metacognitive awareness of the reading comprehension process in the form of monitoring and controlling comprehension. For example, a seventh grade student, when asked how she obtained the meaning of an unknown word, responded as follows:

> "Well, I hardly ever use a dictionary but usually I can get the meaning of the word from the sentences around it or the sentence and the way it is used. Sometimes I think I know it and then I can try putting it in a different way, saying it in a different way to see if it works."

This student described the use of context, the use of synonym substitution, the use of the dictionary, and she implied the last word-related strategy, stated failure to understand a word. The student was aware of the use of the strategies and their availability as she read. She demonstrated a metacognitive awareness of control in the sequencing of strategies. For example, she used context and then synonym substitution and, on occasion, she used the dictionary. Implied also was a monitoring of comprehension in the fact

that the student derives word meaning from surrounding sentences or she attempted substitution. Monitoring of comprehension included the decision as to the effectiveness of strategy use.

The data collected by these research procedures, both traditional and ethnographic, support the hypothesis that gifted readers use a specific comprehension process. Comprehension strategies were used and were monitored and controlled (metacognition). There was a minimal grade level difference in terms of strategies used or metacognitive control.

Results and Discussion

The data analysis revealed that the gifted students participating in this study are gifted readers according to the previously discussed criteria. The 100 students performed above grade level on the ITBS Reading Comprehension subtest. The results of the metacognitive questionnaire supported the frequent use of reading strategies. These gifted students recognized, as responses on the questionnaire indicated, their use of strategies under specific situations as stated in the questions. The traditional research results indicated that these 100 gifted students comrehend in advance of grade level peers, used specific reading strategies in the process of comprehending, and were metacognitively aware of availability, selection, and use of strategies. Grade level

difference was minimal. The questionnaire results implied a frequency of strategy use for each grade that varied very little between grades.

The protocol analysis and interview components supported the results of the traditional research procedures. During protocol analysis sessions specific strategies were used and discussed by participants. These same strategies became the focus for the ethnographic interview. During the interview, the 20 gifted readers acknowledged use of strategies, gave reasons for use of strategies, and explained how strategies were used and comprehension assessed. Table 3 identifies and defines these strategies. Table 4 provides a student's description of each reading comprehension strategy as it was applied to specific text.

Within the context of the ethnographic interview, the subjects revealed their metacognitive awareness of strategy use and control. The interview focused on what strategies were used, how they were used, and why the strategies were used. The individual's control over the reading process became apparent as these students discussed such strategies as rereading. The following response to a question about not understanding the text includes (a) how the student recognizes the need to use the stategy, (b) rationale for selection of the strategy, (c) method or application, and (d) evaluation of effectiveness.

TABLE 3

Reading and Reasoning Strategy Definitions

Reading Strategies: Three strategy groups. Strategies may occur singularly or be used simultaneously.

I. Word related strategies: pertains to word meaning within passage.
   context--use of context to define a word or use of contextual information to define a word.
   synonym substitution--use of a synonym in place of a word used in the text. Synonym substitution is used to check the meaning of a word in the text or to "translate" the text into a more meaningful statement for the reader.
   failure to understand a word--the subject states that the word is unknown. The use of other strategies may then follow to identify the word.

II. Context-related strategies: pertains to understanding statements or ideas as presented within the text.
   rereading--return to the text for reading again for one or several reasons: did not understand the first reading, need clarification, an idea needs reinforcement, etc.
   inference--interpretation of the text based on information within the text.
   failure to understand a clause--subject states an inability to understand a clause or sentence or paragraph. Other strategies such as rereading may then be applied.
   use of information about the story--information from the immediate text is related to the overall story or used to understand new information in the story.

III. Meaning-related strategies: employed when the subject is attempting to gain an understanding of a larger concept than the literal statement of text. These strategies usually require the interaction of several knowledge sources.
   personal identification--the subject relates what is in the context to personal experience(s) and usually elaborates the contextual statement in some way emotionally, visually, or informationally.
   addition of information--the subject adds personal knowledge to the information provided in the text. The addition usually elaborates the context and enriches comprehension.
   hypothesis/anticipation--subject predicts or indicates awareness of what will follow based on words in context, subject's own experience and/or prior knowledge.
   imagery--subject visualizes the meaning of the text. This may involve addition of information, comparisons, etc. Imagery may be used for clarification or as a check for understanding.

TABLE 4

Protocol Analysis: Examples of Strategy Use

Strategy	Text	Protocol
Reading Strategies		
1. use of context	"Currently in the United States, we are faced with a serious additional problem: the supply of minerals is dwindling . . ."	"I had to skim back over the second one because it wasn't a full sentence and I was trying to pick up what I was reading and there was a word in there I didn't understand and I went back and reread the words that were around it and then I understood it" (dwindling).
2. synonym substitution	"Currently in the United States, we are faced with a serious additional problem:"	"I used 'another' for 'additional.' It's like when you are talking, say you're using the word 'additional.' It's easier to change it to another word more people are familiar with like 'more.' I do this when I'm reading. It's easier to relate to. It cleans up my thinking process by not jamming it up with all those other words."
3. stated failure to understand a word	"Such reclamation can be stepped up still further."	"I don't know what 'reclamation' means. I usually look it up in a dictionary or try to get it out of the sentence."
4. rereading	"One study estimates that 3 million metric tons of aluninum, zinc, copper, lead, and tin are contained in the 34 million metric tons of trash. . ."	"I'm going back because that's a long sentence and I needed more time to understand it. There were more facts in it and I thought it was pretty important. It seemed to say a lot of things in it and I wanted to make sure of what it was trying to tell me."
5. inference	"Look! Look! And there was only water sheen"	"I think he saw an illusion because the water was shiny."

Strategy	Text	Protocol
6. use of information about the story	"One study estimates that 3 million metric tons of aluminum, zinc . . ."	"I can imagine 34 million, 3 million metric tons of this stuff but it's kind of hard. I used the other information in the story to understand that sentence."
7. personal identification	"Four is to recycle scrap and waste materials."	"I've been involved in recycling a lot of scrap material because last year I was collecting aluminum cans. I can relate to it a little better seeing as how I've done some of it. It's easier to relate to because I know what is going on."
8. addition of information	"Experts agree that there are four things we can do to prevent our mineral cupboard from becoming bare."	"That reminded me of the short story about Mother Hubbard and her cupboard because they mention the cupboard from becoming bare. Again, I reread and looked for key words. In this, I like to think when I read--think of different other things besides the sentence. It gives me a more general idea of what the sentence is telling me."
9. anticipation	"Experts agree that there are four things we can do . . ."	"It says there are four things we can do to keep minerals from disappearing, but you have to keep reading because you don't really know what they are."
10. imagery	"The water rose to form a pool, mirroring Leaf-lace"	"I really didn't understand the poem very well and I was trying to picture it and what it would be like: picture of a fallen tree and spring but sometimes the picture didn't come out right because, like here in the second stanza I was trying to picture roses forming a pool. Finally I got it the right way: 'the water rose to form a pool.'"

"If it's a factual book, I'll go back and read it again. And if it is a story that is boring, you tend to skip over lines that aren't really important. I'll skip over it because I can pick up the meaning later. It depends on what I am reading."

This example illustrates use of strategies and, more specifically, metacognition in relation to control, selection and evaluation of strategies. Other examples of responses to interview questions follow in Table 5.

The protocol analysis and interview revealed no grade level difference in terms of strategies used or metacognition. All four grades demonstrated application of each of the strategies. The number of times particular strategies were used by different grade levels varied but with no consistant difference. The focus was not on number of times used but on how the stategy was selected and applied. Protocol analysis sessions and interview did not indicate grade level difference in metacognition. All 20 students were metacognitively aware of strategies, selection, use, and evaluation as demonstrated within described protocols and discussed in response to interview questions. The ethnographic research procedures confirmed the use of comprehension strategies in the reading comprehension process. That these gifted readers were metacognitively aware is also affirmed by the analysis of protocol analysis

TABLE 5

Interview Questions and Typical Responses

1. When you encounter an unknown word, what do you do to obtain its meaning?

   "Most of the time I look at the surrounding words and see if I can get an idea from there, and if not, I see if there is another word that may fit in place of the other word I don't understand and if that does not work, I will, if I'm home, look it up in the dictionary. If I don't, I may let it be and see if I can find it later on." (Male, 7th grade)

2. When you realize you have not understood or don't remember, what do you do?

   "Usually first I'll skim it, go back, to see if it is important enough to go back and read--if it contributed to the understanding of it. If it does, I'll go back and read it over. I know to reread because I won't notice it in my mind, but when I go to the next sentence it sometimes doesn't make sense or it refers to something and I know I've missed it. Sometimes I just realize after I read it that I just didn't really read it." (Female, 7th)

3. What are some of the ways you reread to gain an understanding of the passage? What do you do and what do you look for?

   "If I need to find a single sentence or bit of information, I'll go back to the passage and find it like the name of a baby kangaroo, I'll find the paragraph about kangaroos and skim until I find the answer and read a little bit after. If I need to find out about the whole thing, I'll go back and really dig into it." (Male, 5th)

4. What is the difference between skimming, scanning, and rereading?

   "For skim sometimes I look quickly, I just look at the sentence and go on. Sometimes I look slowly and carefully for key words, key sentences, main ideas, and words that fit the main idea. For rereading, I reread the whole sentence. I read everything slowly and carefully so I'll get a better understanding." (Male, 6th)

5. What comparisons do you make between your own experience and knowledge and the subject of the text?

   "Sometimes, like in the poem 'Belief,' I imagine I am in the park with my friend, we have done that before--we chase each other in the park and we go down by the river

and there are places like they mentioned there. The comparison 'emphasizes' it more because you are more familiar with it." (Female, 5th)

6. What are some of the ways you predict (anticipate)?

"I know what is going to happen next because of the information before it. My information helps too because if you know what the character is going through, you can usually pick out what is going to happen next." (Female, 4th)

7. In what ways do you use what you know about a topic with the information in the text?

"It helps me a little bit because I know a little more about it, it informs me. What I know kind of joins what I am reading--it just adds on." (Female, 5th)

8. To what extent do you use imagery?

"Usually it is like I am there. I pretend like I am there but I am invisible like I'm just listening in. I enjoy the book; it doesn't matter the book. I use imagery in social studies talking about indians. I pretend I'm there and invisible. Then it helps me to understand what we are talking about more and I get a better grade." (Female, 4th)

and interview results. No grade level difference existed in strategies used or in metacognitive awareness.

Implications

The results of this study relate primarily to the sample. The size of the sample provided the opportunity for close analysis of the individual reader's comprehension process. The study is limited by the sample size and by the broad definitions of the strategies. Though the strategies are broadly defined, each definition refers to a particular method or approach in achieving comprehension and allows for varied descriptions of that specific strategy.

Despite the limitations, the study does contain some implications for the reading instruction used with gifted readers. The reading comprehension process of gifted readers involves the control, selection, use, and evaluation of specific comprehension strategies. These gifted readers recognized the need to use strategies, when and how to apply the strategy, and if the strategy was effective in achieving comprehension.

This description of the reading comprehension process as employed by gifted readers also contains implications for teachers of the gifted. Teachers need to be aware of the reading comprehension process as employed by gifted readers, of the types of strategies employed, and of the control over the strategies which the reader exercises. This

understanding of the gifted reader's reading comprehesnion process may imply a need for change in teaching practices. In addition to instruction in critical and creative reading, instruction may include use of and control of the comprehension strategies. Instructional methods which develop and strengthen the strategies may be used. For example, imagery, a strategy which was not originally included but which emerged as one frequently employed, may become a focus of some reading assignments. In order to provide the reader with opportunities to reinforce retrieval of past experiences or prior knowledge as a means to comprehension, imagery strategy should be used.

There are specific implications which emerge from the results of this study in terms of teacher behavior. Teachers should be aware of the types of strategies gifted readers use. These strategies and their use could then be incorporated into the instructional plans for teaching critical and creative reading skills. Teachers should also become aware of their own reading process and what strategies they employ. This awareness of successful strategy implementation should be used to adapt reading instruction so that control over strategy selection and use is strengthened. The use of these strategies by gifted readers has been primarily an intuitive, tacit use. Teachers' awareness of strategies and their use in the reading comprehension process may stimulate an awareness and explicit use of strategies on the part of the gifted reader, thereby strengthening the reading

process.

Implications for general reading instruction also emerged from results of this study. Early readers, good readers and gifted readers develop and use many of the reading strategies on their own without formal instruction. The strategies are aids to comprehension and are integrated into the overall reading process. Strategy control, selection and use should become a part of the reading instruction process. Content area reading instruction involves strategies such as guided reading and structured overviews to activate previous knowledge about the subject, to establish purposes for reading, and to assist in the understanding of the text. Instruction in use of strategies may also enhance the processing of print. The integration of instruction in strategy use and metacognitive control with the regular reading instructional procedures may be beneficial to all students, not only the gifted.

Summary

Gifted readers employ varied reading strategies for comprehension. In addition, gifted readers in this study employed a strategy not identified in previous research with good readers: use of imagery. As used in this context, imagery for the gifted reader indicated a visualization of the text meaning. Gifted readers also demonstrated metacognition in the form of monitoring and controlling

strategy use and determining effectiveness. There was no grade level difference in terms of strategy use or metacognition.

Additional research with other readers is necessary to strengthen the understanding of the reading comprehension process, to determine strategy and metacognition differences between readers with different levels of ability, to confirm the results of this study, and to develop instructional techniques which would incorporate strategy use and control. Results of this study suggest that instruction in strategy use and metacognitive control may facilitate the growth of reading comprehension for gifted readers.

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